

# Laboratory of Miniaturized Chemical Systems



## Current research works

- Development of microfluidic systems for cell culture, passage process, cytotoxicity tests, and evaluation of photodynamic therapy (PDT) procedures.
- Designing and development of integrated microfluidic chips for clinical diagnostics of lysosomal storage disorders.
- Development of microfluidic-based *in vivo*-like cellular models for drug screening and toxicological tests; investigations on microfluidic chips for Multicellular Tumor Spheroid (MCTS) formation, culture and analysis.
- Development and manufacture of polymer based microfluidic devices by micromilling and thermal bonding.

## Selected publications

- K.Ziółkowska, R.Kwapiszewski, Z.Brzózka, *Microfluidic devices as tools for mimicking the in vivo environment*, New Journal of Chemistry, in press (2011)
- R.Kwapiszewski, M.Skolimowski, K.Ziółkowska, E.Jędrych, M.Chudy, A.Dybko, Z.Brzózka, *A microfluidic device with fluorimetric detection for intracellular components analysis*, Biomedical Microdevices, in press (2011)
- E.Jedrych, Z.Pawlicka, M.Chudy, A.Dybko, Z.Brzózka, *Evaluation of photodynamic therapy (PDT) procedures using microfluidic system*, Analytica Chimica Acta, 683, 149-155 (2010)
- K.Ziółkowska, E.Jedrych, R.Kwapiszewski, J.Lopacinska, M.Skolimowski, M.Chudy, *PDMS/glass Microfluidic Cell Culture System for cytotoxicity tests and cells passage*, Sensors and Actuators B., 145, 533-542 (2010)
- M.Chudy, I.Grabowska, P.Ciosek, A.Filipowicz-Szymańska, D.Stadnik, E.Jedrych, M.Juchniewicz, M.Skolimowski, K.Ziółkowska, R.Kwapiszewski, *Miniaturized Tools and Devices for Bioanalytical Application: An overview*, Analytical and Bioanalytical Chemistry, 395 (3), 647-668 (2009)
- M.Juchniewicz, M.Chudy, Z.Brzózka, A.Dybko, *Bonding-less (B-less) fabrication of polymeric Microsystems*, Microfluidics and Nanofluidics, 7, 733-737 (2009)

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## Research profile

### Evaluation of microfabrication technologies:

Soft lithography and replica molding  
Wet etching  
Micromilling  
SU-8 photolithography  
Screenprinting  
Combined methods

### Evaluation of optical and electrochemical detection methods

Micromechanics

### Development of microsystems for clinical diagnostics

Cell engineering

Cell-based toxicology studies

Intracellular components analysis